Wave Propagation Across Muddy Seafloors

Steve Elgar (elgar@whoi.edu)
Britt Raubenheimier (britt@whoi.edu)

Applied Ocean Physics and Engineering Department Woods Hole Oceanographic Institution Woods Hole, MA 02543 phone: (508) 289-3614 fax: (508) 457-2194

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Summary of Results

The **primary objective** was to develop field-verified models for the evolution of surface-gravity waves propagating over a muddy seafloor, allowing more skillful predictions of wave fields on continental shelves, and enabling the estimation of characteristics of the seafloor from wave observations. The **approach** was to investigate empirical and theoretical expressions for mud-induced damping by comparing field observations with numerical model simulations. The damping caused by a muddy seafloor was investigated by simultaneously observing surface waves, near-bottom currents, and in collaboration with MURI investigators, characteristics of the mud layer and associated sediments. The field observations have allowed testing of existing hypotheses for mud-induced damping of the wave field, as well as the development of new formulations and parameterizations for the dissipation that can be used in both research and operational wave models.

The observations are being used by several colleagues for additional studies of wind-driven waves propagating across shallow seafloors. Collaborators using our field observations include Drs. A. Sheremet (U. Florida), T.H.C. Herbers (Naval Postgraduate School), T. Janssen (San Francisco State U.) and their graduate students and post-doctoral researchers. In addition, MURI collaborators Drs. P Traykovski and J. Trowbridge (WHOI) also are using our field observations in their studies of mud-induced dissipation.

The field observations are available on line at http://science.whoi.edu/users/elgar/WORMSEX/index.html.

All time series, as well as processed data products (means, variances, spectra) are available. Many scientists, students, and engineers from universities, government laboratories, the Department of Defense, and private companies have downloaded the observations.

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Results from this project are described in detail in the following publications:

Elgar, Steve and Britt Raubenheimer, Wave dissipation by muddy seafloors, 2008 *Geophysical Research Letters*, L07611, doi:10.1029/2008GL033245.

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